REMARKS

Claims 1-32 are pending in the present application. Claims 12, 22, and 32 are withdrawn. Claims 15 and 25 are rejected under 35 U.S.C. 112, claims 1-3, 5, 6, 8, 9, 13-15, 17, 19, 20, 23, 24, and 26 are rejected under 35 U.S.C. 102(b), and claims 4, 7, 10, 11, 16, 18, 21, 25, and 27-31 are rejected under 35 U.S.C. 103(a). Claims 1, 13, 23, and 25 are amended. No new matter is added. The rejections are respectfully traversed in light of the following remarks, and reconsideration is requested.

Rejections under 35 U.S.C. § 112

Claim 15 was rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The Examiner states that "There is no enabling disclosure to permit the two limitations to be performed. The first limitation requires the gases to be stationary and the second requires rotation of the gases, which is the exact opposite for the depending claim."

Claim 15 recites "the first process gas and the second process gas are not diverted from the plurality of wafer stations". Thus, the limitation of claim 15 is that the gases are not diverted from the stations, not that each gas is not diverted from individual stations. This is set forth in Applicants' specification at page 17, lines 13-20, which states in part "all process flows are introduced into multi-wafer sequential deposition module 502 or 602 without the use of a divert scheme (e.g., a gas flows diverted to bypass, such as to the system vent or pump)." So, claim 15 requires that the gases not be diverted from the stations, such as to a pump or vent. Advantageously, "pressure and flow remain constant and the system is balanced", as set forth in Applicants' specification at page 17, lines 16-17.

Accordingly, the process gases can be rotated sequentially between stations in the deposition chamber, but still not be diverted from the stations. This situation occurs when the

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process gases are not pumped out of the chamber. Thus, Applicants believe claim 15 is enabling and complies with 35 U.S.C. 112, first paragraph.

Claim 15 is also rejected under 35 U.S.C. 112, second paragraph, as being indefinite. In particular, the Examiner states that "it is unclear what 'not diverted' is intended to mean because claim 13, which claim 15 depends, recites rotating the process gases . . . In other words, how can a person of ordinary skill not divert gases while rotating them between wafer stations?"

As discussed above, claim 15 does not require that the gases not be diverted from individual stations, but rather the gases are not diverted "from the plurality of wafer stations". Thus, Applicants believe that claim 15 is definite, since the gases can be rotated between individual stations, yet still not diverted from (all) the plurality of stations, such as to a pump.

Claim 25 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite. In particular, the Examiner writes that "Claim 25 recites, 'a delta shape'. It is unclear what a 'delta' shape is intended to represent."

Claim 25 has been amended to delete "delta shape".

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. 112.

Rejections under 35 U.S.C. § 102

Claims 1-3, 5, 6, 8, 9, 13-15, 17, 19, 20, and 23 were rejected under 35 U.S.C. 102(b) as being anticipated by Gadgil et al. (US 5,879,459). Gadgil et al. disclose a "vertically stacked process reactor and cluster tool system", in which a plurality of wafers are stacked in a vertical stations within a reactor unit. Thus, the plurality of wafers are overlapping within a reactor unit. Further, the Examiner states that in Gadgil et al., the substrate can be unloaded from one compact rector unit and reloaded to another compact reactor unit in any sequence

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(col. 13, lines 1-5). Thus, the rotation of the substrate or wafer is between two different reactor units. Finally, in the rejection, the Examiner states that Gadgil et al. "discloses there may be two or more valved charged tubes adapted for injecting separate gases into individual reactors and operation of a remotely-operable charge valves and injection valves is programmable to integrate injection gases into the individual compact reactors in concert with transfer of substrates into and out of compact reactors (col. 6, ln 10-30)". Thus, Gadgil et al. discloses that different gases can be injected into an individual reactor.

In contrast, claim 1 has been amended to recite "providing a multi-wafer sequential deposition module having a plurality of non-overlapping wafer stations" and "rotating the first process gas and the second process gas within the deposition module sequentially to at least the first wafer station and the second wafer station." Support for the amendments are found in Applicants' specification at Figs. 5-8 and corresponding text, and thus no new matter is added. The method of claim 1 provides a plurality of non-overlapping wafer stations within one deposition module. Gadgil et al. has a plurality of vertically stacked wafer stations within one reactor. Furthermore, the method of claim 1 rotates process gases sequentially to a first wafer station and a second wafer station within the one deposition module. To the contrary, Gadgil et al. arguably discloses rotating gases sequentially (injecting different gases in sequence) within the reactor, but this is not done sequentially to a first station and a second station.

Thus, for the reasons discussed above, Applicants believe claim 1 is patentable over Gadgil et al.

Independent claim 13 has been amended to recite "moving a plurality of wafers in a sequential order among the plurality of non-overlapping wafer stations" and "rotating the first process gas and the second process gas within the deposition module sequentially to at least

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the first wafer station and the second wafer station". Thus, for reasons similar to claim 1 above, claim 13 is patentable over Gadgil et al.

Independent claim 23 has been amended to recite "providing a multi-wafer sequential deposition module having a plurality of non-overlapping wafer stations" and "rotating and flowing one or more types of gas compositions through one or more of the plurality of showerheads". Thus, for reasons similar to claim 1, claim 23 is patentable over Gadgil et al.

In addition, claim 23 has been amended to recite "rotating the plurality of wafers within the deposition module in a sequential, continuous fashion". Support for the amendment is found in Applicants' specification at Figs. 5-8 and corresponding text, and thus no new matter is added. Gadgil et al. discloses transferring wafers from one reactor to another, such as shown in Fig. 7. Thus, the rotation, if any, of wafers is between two reactors, not within one deposition module. Thus, for this additional reason, claim 23 is patentable over Gadgil et al.

The remaining claims depend on claims 1 and 13 and are thus patentable over Gadgil et al. for at least the same reasons as claims 1 and 13.

Claims 23, 24, and 26 were rejected under 35 U.S.C. 102(b) as being anticipated by McInerney et al. (US 6,143,082). McInerney et al. discloses a multi-station processing chamber, in which wafers on the stations are rotated for processing under corresponding showerheads.

Claim 23, as amended, recites "rotating . . . one or more types of gas compositions through one or more of the plurality of showerheads". McInerney et al. does not disclose rotating gases, but rather only rotating wafers. Thus, claim 23 is patentable over McInerney et al.

Claims 24 and 26 depend on claim 23 and are thus patentable over McInerney et al. for at least the same reasons as claim 23.

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Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections of the claims under 35 U.S.C. § 102(b).

Rejections under 35 U.S.C. § 103(a)

Dependent claims 4, 7, 10, 11, 16, 18, 21, 25, and 27 were rejected as being unpatentable over Gadgil et al. in view of Haines et al. (US 5,251,148), Izu et al. (US 4,545,136), Rossnagel et al. ("Plasma enhanced atomic layer deposition for Ta and Ti for interconnect diffusion barriers") and Nakayama et al. (US 5,125,360), Rossnagel et al. and Foster et al. (US 8,66,213), or Ameen et al. (US 6,143,128). These references were cited by the Examiner for disclosing various limitations in the above dependent claims. However, none of the cited references remedy the deficiencies of Gadgil et al. as applied to claims 1, 13, and 23 discussed above.

Accordingly, dependent claims 4, 7, 10, 11, 16, 18, 21, 25, and 27 are patentable over the cited references for at least the same reasons as claims 1, 13, and 23.

Dependent claims 25 and 27-31 were rejected as being unpatentable over McInerney et al. in view of Izu et al., Nakayama et al., Foster et al., or Ameen et al. Again, these references (same as above) were cited by the Examiner for disclosing various limitations of the above claims dependent on claim 23. However, none of the cited references remedy the deficiencies of McInerney et al. as applied to claim 23 discussed above.

Accordingly, dependent claims 25 and 27-31 are patentable over the cited references for at least the same reasons as claim 23.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections of the claims under 35 U.S.C. § 103(a).

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